Development of Algorithms and Strategies for Monitoring Chlorophyll and Primary Productivity in Coastal Ocean, Estuarine and Inland Water Ecosystems

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GOAL:

Develop the scientific and statistical basis for monitoring algal pigments and primary productivity in coastal, estuarine and inland ecosystems using satellite data and complementary surface measurements.

OBJECTIVES:

1. **Establish a protocol for developing and validating** regional or site-specific **algorithms** for estimating surface chlorophyll-*a* concentration and primary productivity while accounting for the optical variability of other water constituents. (Definition Phase, Feb. '96 - Jan.'97).

2. **Demonstrate the above protocol** by developing chlorophyll and productivity algorithms for near-shore coastal ocean areas and for major estuaries and
inland bodies of water found **in the northeast region of the United States**. (Execution Phase, Feb. '97 - Jan.'99).

3. **Define a strategy for long-term monitoring** using surface and satellite measurements to detect change in surface chlorophyll concentration and primary productivity. (Completion Phase, Feb. '99 - Jan. '00).

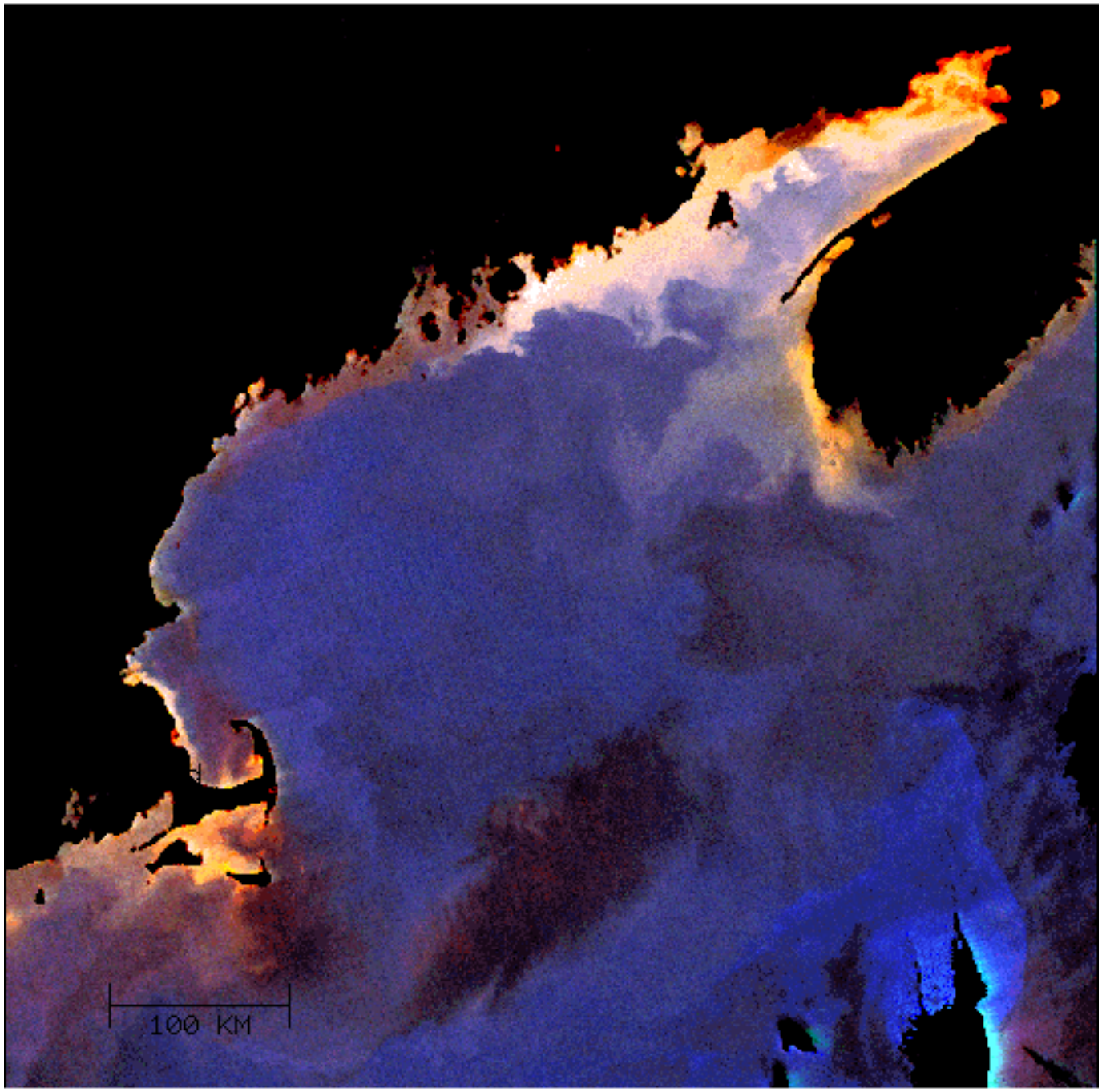
To demonstrate the monitoring strategy, I will produce:

- time series of surface chlorophyll and primary productivity maps for the northeast region averaged over monthly periods beginning with the launch of MODIS

- time series of anomaly maps by subtracting the long-term mean for each month from each monthly map.

My approach in prescribing protocols will be to use the best available, site-specific data to parameterize analytical algorithms. The parameters will be those that minimize the mean square error and/or those that assure unbiased results.

The protocols prescribed as a framework for coastal algorithms will also be useful for land and ocean algorithms developed by other MODIS Team Members.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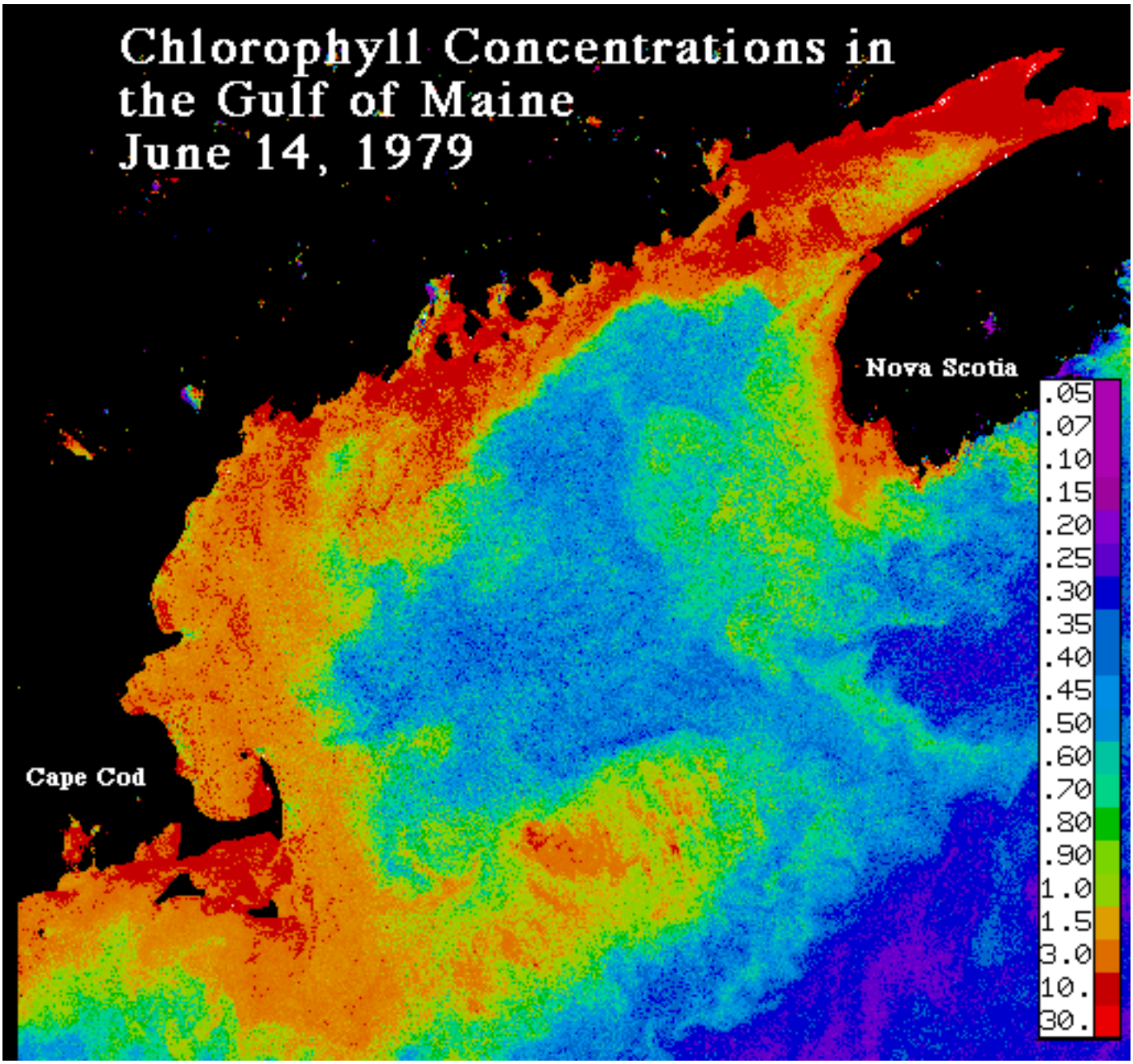
Chlorophyll Concentrations in
the Gulf of Maine
June 14, 1979
Nova Scotia
Cape Cod
.05
.07
.10
.15
.20
.25
.30
.35
.40
.45
.50
.60
.70
.80
.90
1.0
1.5
3.0
10.
30.